

**Free Farm Produce in the Outpatient Psychiatry Waiting Room
A Feasibility Study**

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ABSTRACT

Background: People with mental illness suffer worse physical health and die significantly earlier than do those in the general population. Preventable cardiovascular disease is the most common cause of morbidity and mortality among this patient population. There is inadequate access to minimally disruptive health services tailored for the psychiatric patient population.

Methods: The intervention brings free vegetables and eggs from the Farm at Penny Lane (Pittsboro, NC) to a local outpatient mental health clinic (Carrboro, NC). The intervention also incorporates education on healthy eating for patients in the clinic waiting room. Using observational data and survey data, I collected feedback on the feasibility and acceptability of this intervention from patients, clinic staff, farm staff, and medical students.

Results: All stakeholders rated the service favorably. Suggestions for improvement included organizing recipe demonstrations, recruiting more volunteers to help at the farm, and providing more bags for patients to carry the produce. Medical students noted lack of time to be the main obstacle to helping implement the intervention.

Conclusion: While the intervention received favorable feedback, more rigorous effectiveness research will help better characterize the specific strengths of the intervention and their effects on long-term health outcomes. Future iterations may consider adding more research personnel and employing a different research design. Researchers interested in pursuing such interventions will need to consider the culture of the study community, existing infrastructure and resources, and research designs that will best fit the main objective of their study.

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INTRODUCTION

The psychiatric patient population suffers from a disproportionately high prevalence of physical illness, especially cardiovascular disease.¹⁻⁴ This pattern is present across a wide age span and socioeconomic strata, a heavy ubiquity that has made finding a single health promotion intervention difficult.³⁻⁴

Causes for the worse health outcomes among this population are multiple and nonlinear. Risk factors for developing cardiovascular disease, such as obesity,⁵⁻⁶ hyperlipidemia,⁷⁻⁹ diabetes,¹⁰⁻¹² certain dietary habits,¹³⁻¹⁵ and inadequate physical activity¹⁶⁻¹⁸ are mostly the same in both the psychiatric and general populations. Nonetheless, key differences between these two populations result in higher morbidity and mortality for those with mental illness.

Some of these differences are inherent to living with a psychiatric condition. For instance, mental illness itself has been associated with certain genetic predispositions¹⁹⁻²³ that increase insulin resistance and propensity for weight gain. Many of the common psychiatric conditions manifest in behaviors and attitudes that make it difficult to maintain a healthy weight, such as disruptions to diet or exercise regimen, apathy, anxiety-associated eating, increases in appetite, and lethargy.¹ Common medications for psychiatric conditions, most notably second-generation antipsychotics, also increase the risk of developing metabolic syndrome, obesity, and diabetes by blunting satiety and boosting appetite.²⁴⁻²⁷ Furthermore, by nature of many psychiatric conditions, certain weight loss interventions designed for the general population have not received adequate effectiveness or safety research specific to the mentally ill population. For instance, pharmacologic weight loss agents available to the general population may be contraindicated in those taking psychotropic medications due to drug-drug interactions.²⁸⁻³⁰

Mental illness affects more than just physical health, however. It can also impair one's ability to function at school, work, or in social settings, which consequently results in inferior socioeconomic circumstances.³¹ Unfavorable social determinants of health³²⁻⁴¹ then limit the individual's access to healthy food options, safe exercising environments, and other contextual factors that act as barriers to health improvement. Epidemiological studies suggest that one-third to one-half of those with severe mental illness live below the poverty level.⁴² These data speak to an unemployment rate estimated to be three to five times higher than in the general population. In turn, disparities in health care access and utilization compound the inherent symptoms of mental illness that impede physical health care.⁴³

For a population that already suffers elevated rates of physical illness, evidence points to inferior health care quality and quantity received. Many individuals with mental illness seek only primary care or emergency services,⁴⁴ where providers may not have the training or time required to fully address mental health issues.⁴⁵⁻⁴⁸ Unresolved mental health issues in turn exacerbate physical comorbidities and emergency service use. Other individuals seek care only from mental health providers, which may compromise primary physical health care. Inadequate recognition and management of either mental or physical illnesses can result in worse outcomes in both components.⁴⁹

Therefore, mental illness and physical illness are often comorbid,⁵⁰⁻⁵² where each condition serves as a risk factor for the other. Indeed, some studies show that cardiovascular risk factors are associated with more severe psychiatric symptoms and decreased level of functioning.⁵³ Many psychiatric conditions make adherence to medical treatments difficult, and physical illness can contribute to pain and disability that may disorient patients or encourage substance abuse. The growing problem of tobacco use, in particular, may be a major contributor

to the greater mortality in those with severe mental illness.⁵⁴ Taken in aggregate, all these causes may contribute to the observation that those who have mental illness die twenty-five years earlier than those who do not, with the majority of these deaths resulting from preventable physical illness.²

In response to the widening gap in physical health between those with psychiatric conditions and those without, the Affordable Care Act called for better integration of physical and mental health care.^{55,56} Evidence from my limited systematic review of randomized controlled trials on effectiveness of physical health interventions suggests that evidence is encouraging but inconclusive.⁵⁷⁻⁵⁹ In particular, interventions that incorporate some variety of lifestyle modification - including diet and physical activity - demonstrate some effectiveness in lowering weight and other cardiovascular risk factors, but often the studies do not show long-term or follow-up data.⁶⁰⁻⁶⁵ Limitations in research resources, such as time and money, as well as participant motivation, staff and provider support, and policy-level infrastructure can all influence the long-term effects of an intervention. Interventions that demand significant extra effort from the participants may require the provision of more incentives or risk high attrition rates.

Having farm produce in a medical setting is not a novelty. Researchers have already begun to characterize the customer population of hospital markets,⁶⁶ readiness factors for a market in community health centers,⁶⁷ and observed benefits of markets in patient-centered medical homes.⁶⁸ On the other hand, the outpatient psychiatric patient population remains excluded. Therefore, I suggest implementation of an intervention that incorporates lifestyle modifications in a way that is minimally disruptive⁶⁹ to subjects' daily routine. This paper

reports my findings from a mixed methods pilot feasibility study of an intervention that links farm-fresh produce to an outpatient mental health clinic.

METHODS

Intervention

Between 3/12/2015 and 5/14/2015, between once and twice a week, I (the author, JS) delivered freshly harvested farm produce from the Farm at Penny Lane⁷⁰ in Pittsboro, North Carolina, to the community outpatient psychiatry clinic⁷¹ in Carr Mill Mall located in Carrboro, North Carolina. The delivery process began at 8AM and I would set up all the produce onto a large table in the clinic waiting room, where I would remain for the rest of the clinic day. To preserve their freshness, eggs stayed in a fridge behind the clinic check-out line. All other vegetables remained in display boxes on the table, under signs I had created to call attention to the free produce (see Appendix B). I also made signs reminding patients to ask for eggs at check-out, a list of the available produce of the day, recipe ideas for select ingredients on display, a produce availability chart by season, and various nutritional facts about select vegetables.

Upon their clinic check-out, I verbally notified patients of the free produce available. With patients who were open to conversation, I talked about the benefits of healthy dietary habits and how to cook with the available produce of the day. Since approaching patients before their appointments might influence their mental state and disrupt clinic flow, I waited until after their appointment ended to speak with them. My project was determined to be “not human subjects research” by the UNC Institutional Review Board and was thus exempted.

Study Population

Clinic Patients

Patients were adult outpatients diagnosed with a variety of psychiatric conditions, including schizophrenia, bipolar disorder, depression, and other serious conditions with psychotic symptoms; some have comorbid substance abuse disorders. Patients live either independently or in group housing, depending on level of functionality and disease severity. Most have chronic mental illness and regularly come to the clinic for follow-up care, including therapy sessions, medication checks, and physical check-ups, including lab tests. Others come to the clinic for group activities, such as art therapy classes and walking groups. Clinic patients are neither people with acute psychiatric exacerbations nor those presenting with medical emergencies.

Clinic Staff and Farm Staff

The clinic staff comprises attending psychiatrists, resident psychiatrists, psychologists, nurses, and medical support assistants. A primary care physician holds clinic one day each week for physical health care. The clinic and its staff are affiliated with the University of North Carolina Center for Excellence in Community Mental Health⁷² and the University of North Carolina Department of Psychiatry.⁷³ Their areas of focus include chronic severe mental illness encompassing mood and psychotic disorders.

Farm staff includes the farm director, farm manager, farm consultant, social workers, and community mental health workers. Community volunteers also frequent the farm to help manage livestock and produce. The farm and its staff are also affiliated with the University of North Carolina Center for Excellence in Community Mental Health. In addition to serving as

forty-acre farmland, the Farm at Penny Lane also holds social and therapeutic activities for community members living with mental illness. The site, therefore, also contains areas for pet therapy and horticulture therapy, a walking trail, and other outdoor activities. Farm volunteers are often also patients at the clinic. Several staff members, including the director of the farm and the farm manager, regularly work at both the Farm and the clinic. The partnership between the farm and the clinic existed before I began my study.

Medical Students

My role throughout the project was medical student volunteer and research investigator. Farm staff with whom I collaborated were interested in whether more medical students would be able to continue my work in the future, especially given a pre-existing shortage of staff and volunteers at the farm. Medical students who participated in the survey are those involved in three student interest groups at the University Of North Carolina School Of Medicine, selected for the groups' relevance to this intervention.⁷⁴ These groups were (1) Psychiatry Student Interest Group,⁷⁵ (2) Public Health Interest Group,⁷⁶ and (3) Student Health Action Coalition (SHAC) volunteer group,⁷⁷ composed of medical students who volunteer at the local community clinic to provide free primary care for underserved populations. Eligible students spanned all stages of medical school training.

Data Collection

Pen and Paper Surveys

I designed short, anonymous paper surveys for patients, clinic staff, and farm staff (see Appendix B). While the three surveys are different, they all ask their respective respondents

about the overall acceptability of the intervention as well as additional comments or suggestions for improvement. Question format was mixed, and included Likert scales, yes/no responses, multiple responses, and free text. The main objective of administering these surveys was to explore specific variables that contribute to the intervention's desirability from multiple stakeholder perspectives. These results can then be incorporated into future pilot studies.

Surveys for patients also asked if they picked up produce on that day or at any time in the past, what they did with the produce, and whether they would like this service to continue. I distributed the patient surveys in the clinic waiting room after explaining my research purpose and obtaining verbal consent from the patients. As the Institutional Review Board did not require further review of my study, I did not need to collect consent on paper, and in fact, consent would have been the only means of identifying respondents. All patients at clinic check-out were asked if they would like to complete the survey, regardless of whether they took any produce. All completed surveys were stored in an opaque cardboard box, which I opened only after the study period ended. No names, medical information, or other identifying information were collected.

I placed blank surveys into the mailboxes of each clinic staff member. The mailboxes covered all regular staff as well as rotating resident psychiatrists. I physically handed a survey to the medical support assistant at the check-in desk as well. For collection, I labeled a large opaque envelope for survey collection and placed it near the mailboxes. At the end of the study period, I took the filled envelope. These surveys asked about clinic staff perspectives on whether the intervention will benefit patients' health.

Similarly, I left a stack of blank surveys for farm staff at the farm conference room, where staff congregate for weekly meetings. Again, I placed a large, labeled envelope next to

the surveys. At the end of the study period, I collected the filled envelope. These surveys asked about farm staff perspectives on whether the intervention will benefit patients' health; additionally, they asked if the intervention changed staff attitudes toward working at the farm.

Online Surveys

To maximize the anonymity of medical student responses, I (also a medical student) designed and distributed their survey online through Qualtrics by asking student group leaders - the identity of whom is already publicly available - to forward the study background and survey link to the students on their group listserv through email. These surveys asked medical students whether the intervention seemed an effective intervention to improve the health of this patient population, if students would be interested in participating, and what additional resources they would need to do so (see Appendix B).

Observational Data

I designed an observation guide template to record patient and staff reactions and comments toward the produce in the waiting room (see Appendix B). The template asked for the service date, starting and ending time, overall setting or circumstances of the day (eg. bad weather, doctor out, etc.), starting and ending produce, and remarks and questions from patients and staff. I filled out this paper template on every day that I performed the intervention. The main objective of collecting observational data was to supplement the survey data, especially with non-verbalized reactions and actions among patients and clinic staff.

Data Synthesis

I transferred all paper survey responses to an Excel spreadsheet. I converted all Likert scale responses into integers from 1 to 5, yes/no responses into integers 2 and 1 respectively, and I transcribed free text verbatim into their respective Excel columns. I completed basic univariate analysis for numerical Likert scale and yes/no responses. I operationalized free text responses into common themes.

RESULTS

By the end of the study period on 05/14/15, I had collected a total of 31 patient surveys, 9 clinic staff surveys, and 7 farm staff surveys. Two patients asked me to read the survey questions out loud and transcribe their verbal responses onto the survey. All other patients completed the survey on their own. Medical student interest group leaders were successfully contacted and all copied me on their emails to their respective student group listserv. Their emails included my description of the intervention and a link to the anonymous online survey.

Overall Impression of the Intervention

Figure 1 compares the percentages among each group of stakeholders responding to the question *How do you feel about having free vegetables at the clinic?* where the possible responses were on a five-point Likert scale from *I really don't like it* to *I really like it*. The vast majority of patients answered *I really like it*, with three answering *I like it*. Similarly, all but one clinic staff answered *I really like it*, and one answered *I like it*. Farm staff, with only seven responses total, included one who answered *I haven't thought about it one way or another*, another one who answered *I like it*, and the remaining five answering *I really like it*.

Who Takes the Vegetables?

Figure 2 displays the produce pick-up patterns by patients, clinic staff, and farm staff, respectively. I asked whether people had taken produce on the day they completed the survey and whether they had done so before that day. Notably, more patients were picking up produce on the day of the survey than they did in the past, and more patients picked up produce than not both on the day of the survey and in the past. Among clinic staff that responded, more stated

they had picked up produce in the past than those who did not, and more stated they will pick up produce in the future than those who did not. Farm staff exhibited the opposite trend, where more farm staff said they had not picked up produce in the past than those who did.

Among patients who said they either did not pick up produce on the day of the survey or in the past, the predominant reason was difficulty carrying the produce or storing it in transit. Correspondingly, when asked what can be done to improve the intervention, most of the respondents mentioned providing patients with more bags with which to carry the produce; some suggested some form of help transporting the produce to patients' next destinations. Another patient responded that having to go to work directly from the clinic precluded him/her from taking the produce. One patient noted that he did not take any vegetables because he was not "sure if the offered vegetables are right for" him.

Observational data shows that several patients refused to take produce because they "know there are others who need it more." Most staff members tended to wait toward the end of the clinic day to pick up an item or two from the leftover produce. I did not personally observe any farm staff picking up produce from the clinic.

Of patients who took produce, the observed amount taken ranged from one item to bagfuls of 4-5 items. Survey responses and observational data show that patients mostly ate the produce they pick up. Some shared the food with family and friends. Only one patient said that he had to dispose of a half a bag of salad mix because it had started to spoil.

Subject Suggestions and Comments

Among patients who completed a survey, one said "I would love to see a group that worked with helping make recipes for the vegetables." Clinic staff and farm staff echo this

sentiment on their surveys. One clinic staff wrote, “We should make a CECMH (*Center for Excellence in Community Mental Health*) cookbook!” (italics mine). Several farm staff members said they would like to see “cooking classes, education on storage and other uses for produce,” and “food prep lessons.” Through observation, I noticed a wide range of cooking and food expertise among the patients and staff. Some verbally shared their recipes, others listened and even jotted down notes. My recipe cards and informational flyers about the vegetables often served as a conversation starter about basic recipes for the items available that day.

Some clinic and farm staff members suggested more publicity for the service. For instance, one clinic staff member said he would “love to see a more organized display of the Penny Lane information, any handouts, and the seasons for the vegetables.” On observation, I noticed that my produce availability chart, which I had pinned on a wall above the display table, often went unnoticed. Farm staff also noted on their surveys that they think “more visibility for the program through the department of psychiatry” and “advertisements” would help to keep the intervention sustainable. Furthermore, farm staff suggested recruiting more volunteers to help plant and harvest the produce on the farm as well as a bigger display fridge to store all the produce in the clinic. Indeed, on most days, I observed that most of the produce was taken by the end of the clinic day, and any leftovers would almost always be taken the next day. One clinic staff member notes, “Some folks are disappointed when it’s not available,” referring to the produce.

Clinic and farm staff also provided their perspectives on the value of free produce to patients. Clinic staff wrote that the intervention “is a great resource for patients and staff” and “may be a way to promote conversation about good health habits.” Another noted that his “patients love the fresh food and believe it is ‘better food’ for them.” At the farm, staff felt that

they were “directly affecting people’s lives without bureaucracy,” and that “the work [they] do is beneficial to clients.” When asked whether having free produce at the clinic will help improve patients’ health, farm staff wrote, “Most patients cannot afford healthy food,” yet “good nutrition leads to physical and mental health,” explaining that “easy access will hopefully result in using it [intervention] to improve health,”

Farm staff also suggested a couple of infrastructural changes. A couple of members suggested having the produce delivered to the clinic more often. Another member proposed that “for sustainability, people who can afford to purchase food could pay for what they take, [and] others could pay on a sliding scale or \$0.” In fact, toward the end of the study period, I heard from farm and clinic staff that they will be switching to a payment system where patients would exchange food stamps for produce. Farm staff noted that using the food stamp system would help regulate uneven provision of produce, where some patients would take excessive amounts and others would be left with little to none. Additionally, farm staff explained, the food stamp system can match patients to the produce they received, thus enabling future research efforts to document patient-specific data.

Medical Student Perspectives

A total of fifteen medical students submitted online surveys during the study period. These were student members of the Psychiatry Student Interest Group, Public Health Interest Group, and Student Health Action Coalition, all affiliated with the University Of North Carolina School Of Medicine.

Provided with a description of the intervention, students tended to rate its potential effectiveness highly, with the average rating at 4.13 (standard deviation 0.35) on a scale of 1

(*ineffective*) to 5 (*effective*). On the other hand, 33% of respondents reported no interest in personally participating in the implementation of the intervention, which can take the form of transporting and setting up vegetables at the clinic and/or organizing medical student sign-ups. Some said they were not sure (27%), and others noted they might be able to help with either of these activities (27% and 27%, respectively). Similarly, 53% said they would not be interested in providing transportation to the Farm at Penny Lane for people with mental illness who wish to volunteer on the farm but have no means of transportation. Of the rest, 13% said they would be interested, and 33% were not sure. Conditional variables for those who were unsure included expected time commitment, availability of a car, and how busy their semesters will be.

Respondents also provided suggestions about ways to help keep medical students involved in and committed to the program. The suggestions ranged from “some free produce!” to a “good location with timing that works well for [students].” One believed that “involvement from 1st and 2nd years” may help, referring to medical students in the first and second years of training. Of note, the first- and second-year medical students at UNC traditionally have fewer patient contact hours and more classroom activities; therefore, they tend to have a little more time for extracurricular activities and are more often in town. Upperclassmen have more fragmented schedules due to changing rotations and off-site clinical sites. Some students believe that “seeing a benefit early on” and “showing [students] how this [intervention] affects their work with patients” can help maintain student commitment in the program. As one student explained, “I think those who enjoy doing this kind of outreach will certainly help out. I imagine the tough part is getting the average student... I’m not completely sure how to get them committed. Perhaps making [the intervention] semester-long.”

DISCUSSION

The mentally ill population suffers worse physical health than that of the generation population, and a large contributor of this health disparity is preventable cardiovascular disease and its risk factors, such as being overweight or obese.¹ In turn, these risk factors disproportionately harm those with mental illness.⁷⁸⁻⁷⁹ This study aimed to explore the feasibility of conducting future effectiveness research on an intervention for the mentally ill population that would bring free farm-fresh produce to the outpatient psychiatry clinic. Through synthesis of observational data and survey data from patients, farm staff, clinic staff, and medical students, I accumulated encouraging evidence that suggests this intervention was well-received, and that associated research may be feasible. Staff from both farm and clinic seem to believe increasing access to healthy foods can improve patients' health, either directly or through behavioral changes.

The farm-to-clinic intervention is not meant to be an isolated food assistance program. By incorporating educational material on healthy eating and engaging patients in conversations about dietary habits, this intervention builds on concepts from behavior change theories and motivational theory.⁸⁰⁻⁸⁵ Integrating conversation topics on self-efficacy, motivation to eat healthy foods, and tangible ways to move toward personal goals (such as picking up produce and recipe sheets) echo the foundational concepts of social-cognitive theory,⁸⁶ self-determination theory,⁸⁷ and control theory.⁸⁸ Addressing perceived and actual obstacles to good health is especially crucial for this patient population, which already receives inadequate health care services.⁸⁹ Strategies to improve the health of the mentally ill population will need to consider not only the primary psychiatric condition, but also contextual social circumstances, since the

worsening of one can exacerbate the other.^{90,91} In fact, multiple studies have demonstrated that food insecurity itself is a risk factor for mental illness.⁹²⁻⁹⁹

While the intervention received generally positive feedback from the different stakeholders surveyed, the complexity and scope of mental illness can be challenging to address when designing studies to assess future iterations of this intervention. Therefore, in the discussion that follows, I present some of the variables that contributed to successes and limitations to the project as well as additional considerations for future research efforts.

Assets

In many ways, the Farm at Penny Lane was already prepared for this project before it even began. Farm staff and community volunteers, many of whom live with mental illness, already regularly grew and harvested produce onsite. Partnerships with the outpatient psychiatry clinic and University of North Carolina Department of Psychiatry had already been established, and the farm staff held a deep understanding of the needs of the community psychiatric population. In fact, the clinic sits in a community already rich in resources for community mental health.

Not only does the UNC Department of Psychiatry have a dedicated Center for Excellence in Community Mental Health, UNC Hospitals also hosts an annual art show exhibiting the creative works of local artists who live with mental illness.¹⁰⁰ The Department of Psychiatry also has its own Assertive Community Treatment (ACT) team,¹⁰¹ which happens to base its daily conferences in an office at the Farm. The ACT model of mental health care emphasizes meeting patients where they are functionally and helping them return to the community by finding stable housing, social networks, and employment. Furthermore, the clinic shares its waiting room for

patients to congregate before art therapy classes and walking groups. Across the street from the clinic, a thrift shop¹⁰² provides social space and employment opportunities for the mentally ill. The shop is based on the Clubhouse Model,¹⁰³ which prior research has shown to be a cost-effective¹⁰⁴ way to help reduce incarcerations,¹⁰⁵ reduce hospital stays,¹⁰⁶ improve well-being,^{107,108} and improve transitional employment results¹⁰⁹ among the mentally ill population.

Aside from infrastructural assets, I also benefitted from material resources already available. In the clinic waiting room, a display table, a small refrigerator, and some wall space allowed me to immediately begin displaying the produce, store eggs, and pin up educational material. Staff, including providers and the medical support assistant at the check-in window, remained enthusiastic and helpful throughout the project, such as telling patients about the vegetables during individual appointments and donating extra bags for patients to carry produce. The appointment schedule was consistent and steady enough that I was able to interact with patients in the waiting room without disrupting clinic flow.

Limitations

Intervention limitations tended to overlap with study limitations. For instance, due to resource and time constraints, I was the only person available to administer the survey, set up vegetables, and create and publicize educational materials. Consequently, I was only able to be at the clinic once or twice per week during the study period, thereby missing whole cohorts of patients on the days I did not attend. Another consequence of limited personnel was small sample sizes for all survey groups. Since this was an exploratory feasibility study, I did not calculate minimum sample size needed for powering the study. On the other hand, even though most clinic and farm staff members responded to the surveys, aggregated responses from

multiple farms and clinics would improve power and broaden the generalizability of the findings. A larger sample size may also allow for subgroup analyses of intervention effectiveness based on specific mental illnesses; in contrast, the current study only addresses patient responses in aggregate, where patients' diagnoses can include mood disorders, psychotic disorders, and/or substance abuse disorders. Using a multi-site sampling method may prove especially illuminating given the wide variety of institutional and community-level cultures around the issue of mental illness. Since my project focused solely on one farm and one clinic in a region already poised for community mental health interventions, my findings may be favorably biased.

That I was the only investigator might have also introduced selection bias and confounding, especially among patients. I delivered the produce, offered the produce, educated patients about healthy eating, engaged in open conversations around recipes, and also distributed the surveys. Since completion of surveys was completely voluntary, patients who agreed to do so may have been predominantly patients who felt strongly about the intervention. Those who picked up produce may have also felt more pressure to fill out the survey as a way of paying for the produce, despite my explanation that survey completion is voluntary and anonymous. Conversely, patients who did not like the intervention may not have bothered with filling out the survey, thus my findings would not have accounted for their perspectives. Finally, surveys may have also missed the subgroup of patients who had to leave in a hurry. As I only approached them during check-out, several patients were unable to stop and fill out the survey or to look at the produce due to having work, school, or other commitments.

Implications for Future Research

More effectiveness research for this intervention will no doubt further elucidate the potential health benefits of providing produce in mental health clinics. Following from the discussion of assets and limitations above, I suggest these considerations.

With regard to research personnel, assigning different research team members for produce delivery, patient education, and data collection can minimize selection bias and confounding. Since the medical students surveyed cited lack of time as the major reason for not participating in the service, future research teams might try recruiting college students, community volunteers, or lay health workers for produce transportation and patient education.

Having more investigators can also help extend the reach of the intervention as well as data collection, especially in clinics that see certain patients on certain days of the week, as was the case in this clinic. If the intervention and study can run more days of the week, a more comprehensive group of patients will be able to benefit from the service and contribute to the research. Extending the study period can allow for long-term documentation of physical and mental health outcomes. While immediate benefits related to picking up free produce can be rewarding, ultimately I hope to assess any effects on distal outcomes such as hospitalization, emergency service use, and cardiovascular morbidity and mortality.

To track these distal outcomes, a vital research component will be the ability to follow specific patients or cohorts over time. In this study, which prioritized participant anonymity, I did not collect any personal information from patients, including age, gender, baseline physical health indicators (eg. weight, BMI), and specific medical and psychiatric diagnoses. For future research that aims to study more quantifiable and long-term data, not only will investigators need to consider collecting identifying patient information, but also associated physical and mental

health indicators. This amount of information may facilitate more detailed analysis of potential dose-dependent or time-dependent effects of the intervention on outcomes of interest, permanence of effects, and interactions among multiple different interventions.

Research methodology will need to fit with the objective of the study. For assessing feasibility and acceptability of this intervention, I adopted an exploratory, mixed-methods approach to generate a diverse range of opinions from various stakeholders. For more specific or quantifiable research, randomized controlled trials (RCT) or quasi-experimental designs may be appropriate. The RCT has traditionally been the gold standard for testing effectiveness of medical interventions,^{110,111} though it may be too restrictive for more public health-oriented interventions such as this one.¹¹²⁻¹¹⁴ Ethical prohibitions can further limit the feasibility of RCTs among the mentally ill population. The limited external validity that often characterizes RCTs may also impede translation of academic publication to real-world practice.¹¹⁵⁻¹¹⁷ Hence, future investigators should strongly consider a synthesis of multiple types of research methods, including quasi-experimental study designs, especially for topics relevant to public health or health policy.^{118,119} Alternatively, implementation of small Plan Do Study Act (PDSA) cycles may help reveal more nuanced setting, personnel, and logistical factors that can inform subsequent versions of the intervention.¹²⁰

Should future researchers elect to conduct an RCT for this intervention, they might also consider the degree of randomization. For instance, randomization at the individual patient level may minimize the potential for selection bias and confounding, but it can introduce contamination¹²¹⁻¹²² if patients in the intervention arm interact with those who do not, thus biasing the ultimate effect size toward the null. Similarly, one might consider the benefits and drawbacks of complete randomization. On the one hand, blinded assignment of intervention

versus usual care may control for self-selection and thus selection bias, but prior research has also shown that assignment into an unfavorable study arm can result in greater attrition.¹²⁴ An alternative allocation method might be the cluster preference RCT model, where randomization occurs at the level of the clinic to reduce contamination and subject preferences¹²¹⁻¹²⁶ can influence study arm assignment. Possible selection bias, however, might be a significant drawback.

Financial Considerations

Toward the end of the study period, I learned that farm staff were planning on starting a payment system for clinic patients who wish to pick up produce. Patients will pay for the produce they take with food stamps through the Electronic Benefits System.¹²⁷

Benefits of switching to this payment system will be multiple, according to farm staff. Having completely free and unregulated produce at the clinic led to the occasional problem of uneven distribution among patients, especially when patients with morning appointments took a lot of produce and afternoon patients had little or no produce left to take. Furthermore, there was no way of knowing how much of the taken produce ultimately went to waste. Although patients answered a survey question on whether they ate, gave away, or threw away produce they had taken from the past, the survey could not quantify the amount wasted, nor track which of the patients habitually wasted produce. The EBT system would track which and how much produce each patient received.

On a related note, the extra tracking information on patients and their produce can potentially facilitate prospective, longitudinal research studies, as discussed above. The EBT system could serve as a source of secondary data that automatically collects patient identifying

information as well as the amount and type of produce they purchased, which can then be subsequently matched to their health outcomes.

Even with these potential benefits, the new payment system may present its own problems. For instance, some patients may not qualify for the Supplemental Nutrition Assistance Program (SNAP),¹²⁸ which provides low-income households with food stamps for use in the EBT system. Of these patients, a subgroup may nonetheless greatly benefit from having easy access to cheap or free healthy foods. Requiring food stamps in exchange for produce would exclude these patients, who previously had access to this service.

The findings from my study suggest that the vast majority of patients who take produce eat the items or share them with family and friends. Aside from one patient who declared that he had to throw away half a bag of salad mix because the vegetables had spoiled, no one else reported throwing away produce. Furthermore, most patients expressed immense gratitude either verbally or on their paper surveys for the free produce. Clinic staff feedback resonated with the gratitude shown by patients. While the food stamp payment system may offer easier data collection and enforcement of equity among those who qualify for SNAP, we must remain cognizant of what - and who - may be left out of the study population.

CONCLUSION

Providing free, farm-fresh produce to outpatients at the psychiatry clinic has garnered positive feedback from patients, clinic staff, farm staff, and medical students. Possible challenges include lack of time, personnel, and financial resources. Future iterations of this intervention are likely feasible, though researchers will need to consider the culture of the study community, existing infrastructure and resources, and research designs that will best fit the main

objective of their study. For instance, the observed enthusiasm and support from the clinic staff throughout this project may be encouraging indicators for a small pilot food distribution program in the future, operationalized into clinic-wide participation in PDSA cycles. Alternatively, clinics and farms may collaborate with a local ACT team to broaden the reach of the intervention.

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FIGURES

Figure 1. Percentages of stakeholder survey ratings for overall impression of intervention

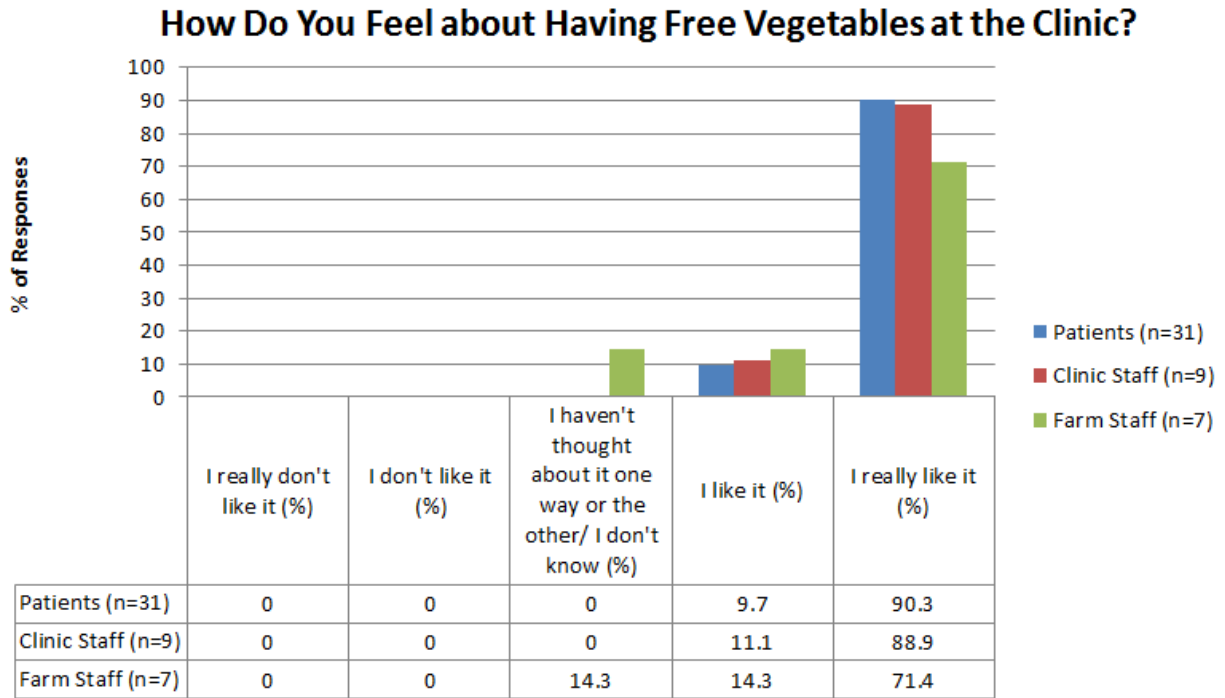
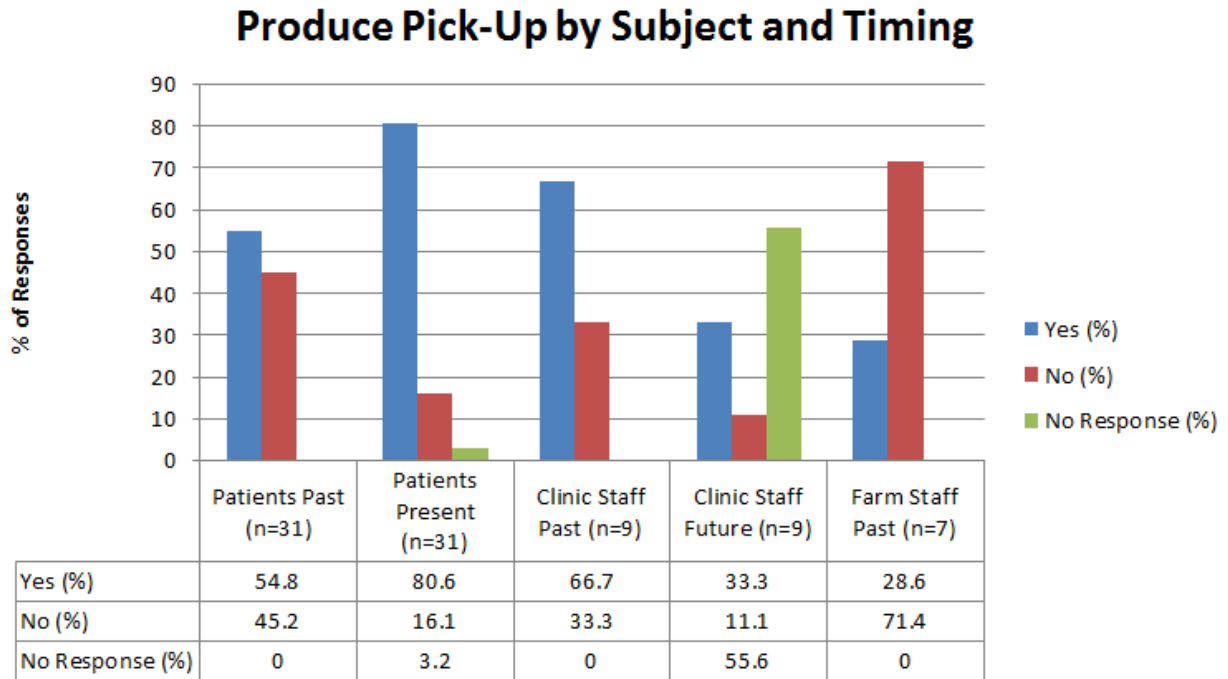


Figure 2. Percentages of stakeholder produce pick-up patterns



“Present” = day of survey completion; “Past” = any time prior to the day of survey completion; “Future” = any time after day of survey completion

APPENDIX A. LIMITED SYSTEMATIC REVIEW

INTRODUCTION

Given the heavy burden of physical illness in the psychiatric patient population, state and federal policies have recently called for better integration of mental and physical health care.¹ For instance, the Affordable Care Act (ACA) included mental health and substance use disorder services as a required “essential health benefit” in addition to enforcing mental health parity with physical health benefits.² Additionally, a majority of states have already begun to implement new strategies to better coordinate care delivered by mental and physical health providers.¹ In the setting of new policies, new systems of care, and new perspectives on mental health care, innovative interventions are many and different.

This limited systematic review seeks to contribute to the growing literature on the latest interventions targeting physical health among the mentally ill population. Secondarily, this review hopes to illuminate some of the common challenges to designing and conducting research in this area.

METHODS

Eligibility Criteria

I considered all completed randomized controlled trials that looked at diet-related interventions for improving the physical health of people with mental illness, including psychotic disorders, substance abuse disorders, and mood disorders. I excluded studies examining general mental well-being, cognitive decline (eg. dementia, Alzheimer’s Disease), neurological disorders with psychiatric components (eg. Parkinson’s Disease, Huntington’s Disease), and eating disorders; I also excluded inpatient interventions. Publication dates were restricted to 5/15/2010

to 5/13/2015. I decided to filter for only studies published within the five years prior to the search date because 2010 saw the passage of the Affordable Care Act, which called for a renewed national effort to better integrate mental and physical health care.¹ The primary outcome of interest was the intervention and its effectiveness. Secondary outcomes of interest were research design and implementation challenges as well as researcher and participant perspectives on the intervention.

Study Selection

I identified studies from searching MEDLINE using the search terms: psychiatry, depression, schizophrenia, mania, psychosis, clinic, outpatient, office, community, garden, food, vegetable, fruit, and dietary. These MeSH terms were also used: psychiatry, depressive disorder, depression, schizophrenia, bipolar disorder, psychotic disorder, ambulatory care facilities, outpatients, residence characteristics, community mental health centers, gardening, food, vegetables, fruit, diet. Additionally, I filtered the results for only randomized controlled trials that were published within the last 5 years (5/15/2010 – 5/13/2015). A university librarian aided me in the process of designing my search string, shown below, to optimize the final selection of results:

```
(psychiatry OR psychiatric OR psychiatrist OR psychiatrists OR mental* OR depression OR depressive disorder OR schizoaffective OR schizophreniform OR schizophrenia OR bipolar OR mania OR psychosis OR psychotic) AND (clinic OR clinics OR outpatient OR outpatients OR office OR community OR community mental health centers OR garden OR farm OR farms) AND (food OR foods OR vegetables OR fruits OR fruit OR diet OR diets OR dietary) AND (Randomized Controlled Trial[ptyp] AND "last 5 years"[PDat] AND Humans[Mesh])
```


Abstraction

For each article reviewed, I collected information on (1) study objective, (2) intervention type, including setting when applicable (eg. community, clinic, sheltered housing), (3) study population, (4) outcomes of interest, (5) findings and conclusions regarding feasibility or effectiveness of intervention, and (6) threats to validity. Table 1 summarizes the objectives, intervention, study population, outcomes of interest, and findings for each of the four studies. Table 2 summarizes my assessment of selection bias, measurement bias, confounding, and generalizability for all the studies, including their overall internal and external validity quality rating.

Quality Ratings

I determined quality ratings for each study based on my assessment of internal and external validity. My criteria for internal validity encompassed risk for selection bias, measurement bias, and confounding. For external validity, I assessed the overall generalizability of the study and its conclusions, taking into account study setting, rigor of intervention, and study population characteristics.

A rating of “good” implies minimal risk of selection bias, measurement bias, and/or confounding in a population that can represent most individuals with the mental illnesses stated above. A rating of “fair” means that the study findings rest on evidence that may be limited by some degree of selection bias, measurement bias, confounding, and/or moderate generalizability. A rating of “poor” implies significant concerns for study conclusions based on high risk of selection bias, measurement bias, and/or confounding; generalizability is limited by highly specific inclusion and exclusion criteria.

RESULTS

Study Selection

A total of 3 studies were selected for review. The original search returned 114 titles on 5/13/2015, from which I excluded 95 articles not relevant for either the intervention type and/or population based on the exclusion criteria. I reviewed the remaining 19 abstracts for relevance to intervention type and study population. The abstract screen resulted in the further exclusion of 12 studies. The predominant reason for exclusion from the abstract screen is wrong study population. For example, several studies focused on vulnerable populations other than the mentally ill, such as the geriatric population, low-income populations, racial/ethnic minorities, and people with cognitive decline.

After full text review of the remaining 7 articles, I obtained the 3 studies I evaluate below. Of the four excluded, one was a protocol³ of a study that was still ongoing at the time of this literature review and thus cannot be evaluated. Two articles are protocols of studies identified for review. The last one⁴ focused on a health personnel service for patients with depression, and though the service involved addressing contextual health factors such as food insecurity, the study outcome of interest was change in depression prevalence, not physical health indicators. Figure A-1 shows a flow diagram summarizing the study selection process.

Study Characteristics

All three randomized controlled studies held a common objective to see if their respective intervention was effective in improving body weight indicators (eg. weight, BMI, fat mass), cardiovascular risk factors (eg. diabetes risk indicators, lipid levels), and/or lifestyle behaviors (eg. dietary habits, physical exercise). Two of the three interventions were similar, encompassing

regular psycho-educational sessions on healthy eating and physical activity with additional supervision for exercise sessions. The third intervention also included a diet and exercise component, though its primary intervention was metformin.

Participants all had mental illness, though in only one study were they of a wide variety (schizophrenia, mood disorders, and personality disorders), while in the other two studies participants were limited to those with psychotic disorders or taking antipsychotic medication. Study settings were outpatient clinics, sheltered housing for mentally ill clients, and community mental health centers. One study took place in Belgium while the other two took place in the United States. Study durations, including both active intervention period and maintenance or follow-up period, were 16 weeks, 36 weeks, and 12 months.

Threats to Validity Within Studies

Jarskog, Hamer, Catellier et al⁵ received a rating of “good” for internal validity and “fair” for external validity. The strengths in their research design include using placebo pills identical to metformin pills, double-blind investigations, randomization at the individual level, and high adherence to regimen. They did not, however, record changes in diet or physical activity as a result of the behavioral component of the intervention, so any interaction between metformin and diet/exercise is unclear. In addition, lack of follow-up data precludes any claim to the long-term harms and benefits of the regimen. Generalizability was relatively broad since they did not restrict participants based on psychiatric medication use, comorbid psychiatric conditions, or chronicity of psychosis; however, they limited the study to those with psychotic disorders who also had a BMI \geq 27, which may compromise applicability of intervention or findings to those

with other psychiatric illnesses, especially because drug adherence may differ by type of mental illness.

Green, Yarborough, Leo et al⁶ also received a rating of “good” for internal validity and “fair” for external validity. The strengths in their research design include randomization at the individual level, low and non-differential attrition in both groups, blinding of staff who took outcome measurements, and comparable baseline demographic, health, and socioeconomic characteristics between groups. They did, however, allow for the control group to pursue alternative weight loss interventions, which may bias the effect size of the intervention toward the null. The recruitment difficulties they encountered – one community mental health center downsizing and otherwise eligible individuals refusing enrollment due to lack of interest in weight loss, lack of time, and scheduling conflicts – limited the applicability of the study to only those participants and providers who do have pre-existing interest and time for the intervention. The inclusion criteria of adults with BMI \geq 27 who are also taking antipsychotic agents further restrict generalizability to individuals with other types of mental illness or body weight.

Verhaeghe, De Maeseneer, Maes et al⁷ received a rating of “fair” for internal validity. One of their main concerns was that an unfavorable study arm assignment would lead participants to drop out of the study, so they countered that possibility by randomizing on the unit of sheltered housing organizations (SHOs) rather than individual clients, and to allow SHOs to choose their own study arm assignment (eg. intervention or control). The randomization that ultimately took place only applied to the 6 SHOs that declared no preference, while 14 SHOs chose the intervention group and 5 chose the control group. This system of partial self-selection may introduce selection bias and confounding in the form of significant baseline differences; indeed, they found significant between-group baseline differences in living situation (living with

others or separately), duration of stay in the sheltered housing, and second-generation antipsychotic use, which is the category of psychiatric medication that is highly correlated with weight gain. Furthermore, there was nonetheless a 40% attrition rate in both groups. When considered in combination with variability in mental health nurse implementation of the intervention and individual SHO differences, this study received a rating of “fair” for internal validity.

On the other hand, Verhaeghe, De Maeseneer, Maes et al received a rating of “good” for external validity. While this study took place in the Flanders region of Belgium, recruitment sought all clients living in SHOs, which encompassed a wide variety of mental illnesses. Overweight and obesity has been shown to affect people with mental illnesses of all types, so allowing all patients to participate broadened generalizability, especially considering that there were no restrictions on BMI either. Furthermore, the criteria for living in sheltered housing in Belgium is similar to many outpatient and community clients in the United States living with chronic mental illness, so we may assume that these findings are applicable to American populations as well.

Study Results

Findings were mixed. Verhaeghe, De Maeseneer, Maes et al found that a 10-week health promotion intervention program resulted in greater weight loss by the end of the intervention period in the intervention group compared to the control group, but a majority of these differences disappeared by the 36-week follow-up. Green, Yarborough, Leo et al, who studied a similar educational program, also found significantly greater weight loss in the intervention group by the end of the intervention period, but their follow-up data followed a post-intervention

maintenance period that involved ongoing sessions with the participants. Perhaps as a result of an extended intervention taper, Green, Yarborough, Leo et al saw a smaller but sustained difference in body weight at follow-up. Finally, Jarskog, Hamer, Catellier et al found that metformin was modestly effective at reducing body weight and other cardiovascular risk factors, but they had no long-term follow-up data to characterize the trend of these effects over time. Furthermore, because both the metformin group and the control group also underwent a diet and exercise behavioral program, the findings do not clarify whether the apparent superiority of the metformin group outcomes reflect only the benefits of metformin or a synergistic effect of metformin plus the behavioral component.

Common challenges encountered during the research design and implementation process include recruitment difficulties, attrition, lack of long-term follow-up data, and variability in intervention implementation. Furthermore, Verhaeghe, De Maeseneer, Maes et al noted the advantages and disadvantages of a cluster preference randomization design, whereby sheltered housing organizations (SHOs), the units of clustering, had the option of deciding which study arm they would like to be assigned. Randomization ultimately applied only to those that expressed no preference. At the risk of increasing selection bias and confounding, the research team potentially minimized any attrition that might have resulted if SHOs received an unfavorable assignment.

CONCLUSION

While several randomized controlled trials have attempted to study physical health interventions among the psychiatric patient population, findings of long-term effectiveness of the interventions, permanence of observed effects, and whether specific portions of an intervention

were sufficient for the demonstrated health benefits were inconclusive. Overall, the three studies reviewed here⁵⁻⁷ showed some degree of weight loss or reduction of cardiovascular risk factors, but each suffered its own shortcomings in either study design or intervention design. Although I had hoped to find an intervention that focused solely on dietary habits, I could only find those that contained a dietary component.

Quality ratings ranged from “fair” to “good” in both internal and external validity, but conducting an RCT of an intervention for the mental health population can indeed be challenging. Despite randomization, for example, other variables may affect the rigor of the study, such as variability among research staff and patients, risk of contamination between study arms,⁸ overall culture of the study settings, local politics, and financial considerations.

The post-Affordable Care Act era has witnessed expanding efforts to integrate physical and mental health,¹ heralding new and ongoing RCTs that explore the potential of various interventions. Given the challenges of sustaining observed health benefits, future studies should consider extending the duration of intervention, collecting more follow-up data, or designing minimally invasive and resource-light interventions that can keep both patients and researchers involved longer.

This review has several limitations. Time and resource restraints limited my search to just one database for RCTs published within the past five years. I also had no second reader with whom to conduct an inter-rater comparison for included articles. Of the selected studies, variability in measurements and outcomes of interest precluded a more quantitative meta-analysis of their findings. For the initial objectives of this review, however, they provided adequate insight into the existing research efforts around interventions for the mentally ill

population^{9,10} as well as the more nuanced difficulties of conducting effectiveness research within the field of psychiatry.

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FIGURES AND TABLES

Figure A-1. Study Selection

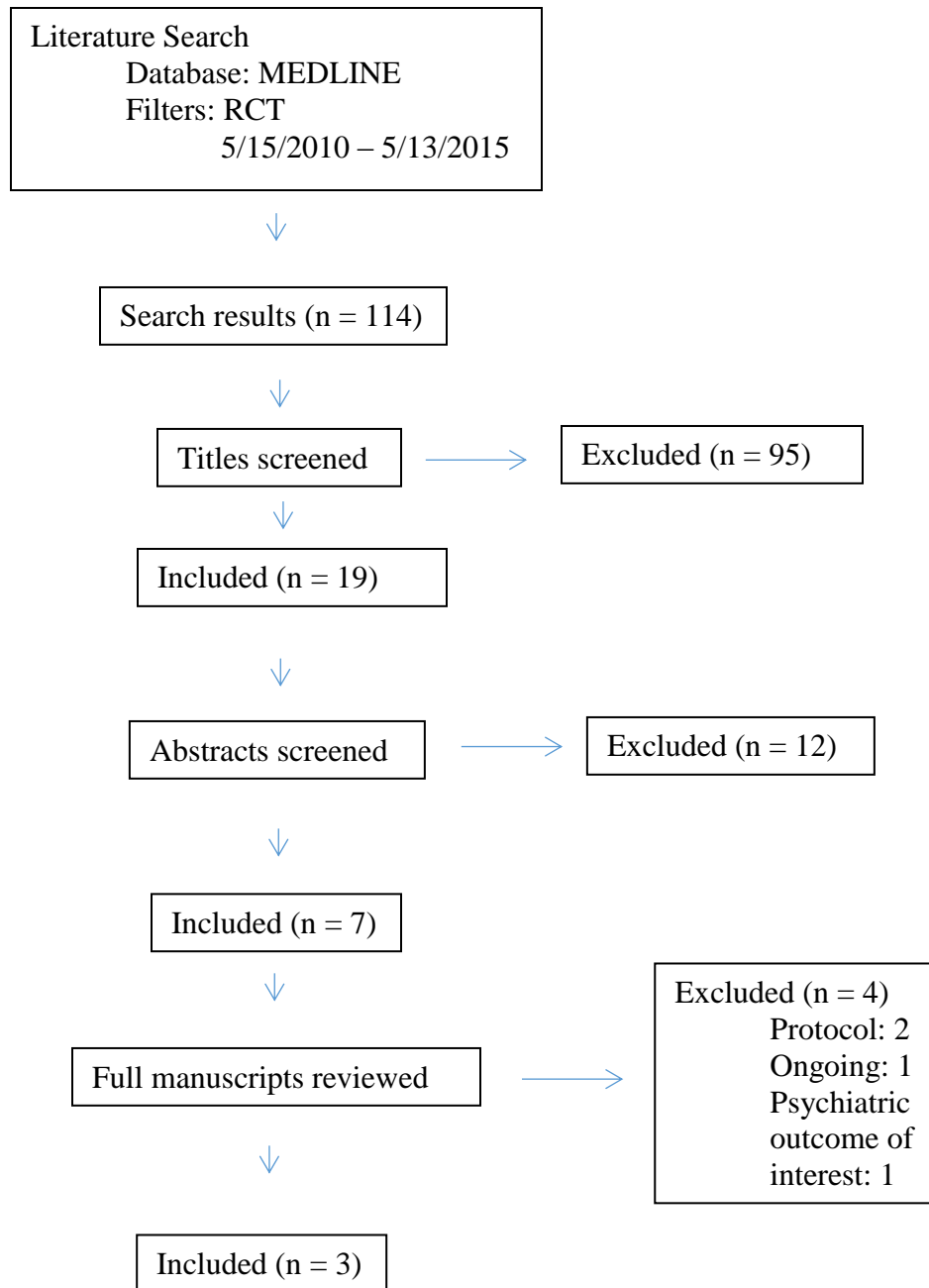


Table A-1. Randomized Controlled Trials on Interventions for Physical Health in Mentally Ill Population

Author, Year	Objective	Intervention	Study Population	Outcome(s) of Interest	Findings
Verhaeghe, De Maeseneer, Maes et al, 2013 ⁷	Assess effectiveness of intervention	10-week program: educational and behavioral group sessions on PA & diet with supervised PA	Residents of sheltered housing for mentally ill patients in region of Flanders, Belgium	Primary: Changes in body weight, BMI, waist circumference, fat mass Secondary: Changes in PA, diet, health-related quality of life, psychiatric symptom severity	Significant differences at 10 weeks in primary outcomes. Most effects disappeared by 36-week follow-up.
Jarskog, Hamer, Catellier et al, 2013 ⁵	Assess whether metformin promotes weight loss	16-week course of metformin plus PA & diet counseling	Overweight outpatients (BMI \geq 27) with chronic schizophrenia or schizoaffective disorder	Primary: change in body weight Secondary: changes in BMI, WC, waist-hip ratio, lipids, glucose, insulin, HbA1C	Metformin modestly effective. No long-term follow-up data.
Green, Yarborough, Leo et al, 2015 ⁶	Assess whether STRIDE reduces weight and diabetes risk	6-month weekly group educational and diet/exercise sessions & 6-month maintenance sessions	Adults taking antipsychotic agents for \geq 30 days with BMI \geq 27; most participants low-income.	Primary: Weight, BMI, glucose, insulin, Framingham Diabetes Risk Score Secondary: SBP, DBP, lipid levels, acute service use, adverse events	Drop in weight, glucose, service use by 6 months & 12 months

PA = physical activity; BMI = body mass index; WC = waist circumference; HbA1C = hemoglobin A1C; SBP = systolic blood pressure; DBP = diastolic blood pressure

Table A2. Summary of Quality Rating

Author, Year	Selection Bias	Measurement Bias	Confounding	Generalizability	Quality Rating	
					Internal Validity	External Validity
Verhaeghe, De Maeseneer, Maes et al, 2013 ⁷	Cluster preference RCT design Baseline differences in living situation, duration of stay in SHO, SGA use. High attrition	Minimal	Baseline differences Variability in program fidelity	Participants all lived in SHOs in Flanders, Belgium Wide scope of mental illness	Fair	Fair
Jarskog, Hamer, Catellier et al, 2013 ⁵	Baseline between-group differences in SES and medication use not measured	Diet/PA not measured	Diet/PA at baseline and throughout intervention SES at baseline	Outpatient, overweight, psychotic disorders only	Good	Fair
Green, Yarborough, Leo et al, 2015 ⁶	Recruitment difficulties, lack of interest in physical health	Minimal	Control group free to pursue alternative weight-loss efforts	Two mental health centers Psychotic disorders only	Good	Fair

RCT = randomized controlled; SHO = sheltered housing organization; SGA = second-generation antipsychotic; PA = physical activity; SES = socioeconomic status

APPENDIX B. FEASIBILITY STUDY SUPPLEMENTAL METHODS AND MATERIALS

Patient Survey

1. How do you feel about having free vegetables here at the clinic? (Please **circle one** response)

I really like it

I like it

I don't know

I don't like it

I really don't like it

2. Are you picking up any vegetables today?

Yes Which vegetables?

No Why not?

3. Have you picked up vegetables from the clinic before?

Yes

No

4. If you have, how did you use them? Please check **all that apply**.

I ate some.

I gave some away.

I threw some away.

If none of these, please write down how you used the vegetables.

5. Would you like us to continue bringing free vegetables to the clinic?

Yes

No

6. Please write below anything we can do to make it easier for you to pick up vegetables at the clinic. (extra bags, storage space, transportation, etc) Use the back if you need it!

Farm-to-Clinic Program Survey for Clinic Staff

1. How do you feel about having free vegetables here at the clinic? (Please circle a response)

I really like it

I like it

I haven't thought about it one way or the other

I don't like it

I really don't like it

2. Have you picked up any vegetables at the Clinic?

Yes

No

3. If you haven't yet picked up any vegetables, do you think you will do so in the future?

Yes

No

Not sure

4. Do you think having free vegetables at the clinic will help improve the patients' health?

Yes

No

Not sure

Please explain _____

5. Would you like us to keep bringing free vegetables to the clinic?

Yes

No

Not sure

Please explain _____

6. Any other questions, comments, or suggestions? Please write them in below!

Farm-to-Clinic Program Survey for Farm Staff

1. How do you feel about having free vegetables at the clinic? (Please circle a response)

I really like it

I like it

I haven't thought about it one way or the other

I don't like it

I really don't like it

2. Have you picked up any vegetables at the Clinic?

Yes

No

3. Does this service change the way you feel about working at the farm?

Yes

No

Please explain _____

4. Do you think having free vegetables at the clinic will help improve the patients' health?

Yes

No

Please explain _____

5. In your opinion, what would it take to keep this program going in the future?

6. Any other questions, comments, or suggestions? Please write them in below!

Medical student recruitment script

Greetings from the School of Public Health!

My name is Jenny Shen, an MD-MPH student interested in psychiatry and community mental health. This is a message for medical students in the Psychiatry Interest Group, Public Health Interest Group, and SHAC Student Group.

I am working on a project where I bring vegetables grown on the Farm at Penny Lane in Pittsboro, NC, to the psychiatry outpatient clinics at Carr Mill Mall in Carrboro. Patients with mental illness are at higher risk of dying from cardiovascular disease, which is partly preventable through a healthy diet. The Farm-to-Clinic project tries to address this challenge by linking the Farm at Penny Lane to the STEP and OASIS clinics for outpatient psychiatric care.

I bring farm vegetables to the clinic waiting room for patients to take for free. In this way, we hope to encourage healthy eating among those with mental illness. We need to know whether this is a project medical students would be interested in continuing in the future. So, in addition to delivering veggies, I am also conducting a study to see if others think this is a good idea. I hope that you can help me by taking this 5-question (~3 minutes), anonymous, no-strings-attached survey.

This online survey aggregates everyone's responses and shows me the overall medical student interest level in this program. **None of your answers can be traced back to you as an individual, and no identifying information will be collected at any point.** After the study, I will report back to the Psychiatry Interest Group, Public Health Interest Group, and SHAC student group on the aggregate results. **No one will be obligated to get involved with this program at any point.**

Thank you SO much in advance! Clicking on the link below will bring you to the survey page.

https://unc.az1.qualtrics.com/jfe/form/SV_dgy7MJDkwL9nwnX

Jenny Shen

UNC School of Public Health, Class of 2015

UNC School of Medicine, Class of 2016

Note: If you *do* want to get involved, please email me at jenny_shen@med.unc.edu and I will be happy to talk with you about the Farm-to-Clinic program!

Medical student survey

1 Does this kind of program – bringing free vegetables to an outpatient clinic setting – seem like something that will benefit patients’ health and wellbeing, or not? I think this program will be... (sliding bar on scale)

- (1) Ineffective
- (2) _
- (3) Don’t know
- (4) _
- (5) Effective

2 Would you be interested in volunteering for Farm-to-Clinic? (Please check all that apply)

- Yes. I can help transport vegetables from the farm to the clinics and set up the vegetables in the display case. (1)
- Yes. I can help organize medical student sign-ups and communicate with farm staff about student volunteer schedules. (2)
- I am not sure. (3)
- No, I am not interested. (4)

3 What do you think it would take to keep medical students involved in and committed to this program?

4 The Farm at Penny Lane serves as a space for volunteers from the community to come together. Many of these volunteers are community members with mental illness. Some people would like to volunteer at the Farm, but have no means of transportation. In your free time, would you be interested in providing transportation for them? The volunteer days have been Wednesdays, Fridays, and Saturdays (though they may change in the future).

- Yes (1)
- Not sure. It would depend on: (2) _____
- No (3)

5 Any other questions, comments, or suggestions?

OBSERVATION GUIDE TEMPLATE

Date and Time	Setting (weather, holiday, special events)	Starting produce, recipe cards	Ending produce, recipe cards	Questions and comments received about produce (no identifying information)
Start: End:				
Start: End:				
Start: End:				
Start: End:				

Free Veggies and Produce!



Brought to you by



The Farm
at Penny Lane

Free Veggies and Produce

Brought to you by  The Farm
at Penny Lane

Reminder: Always WASH or RINSE
vegetables and produce before eating!

We have EGGS!

Just ask!

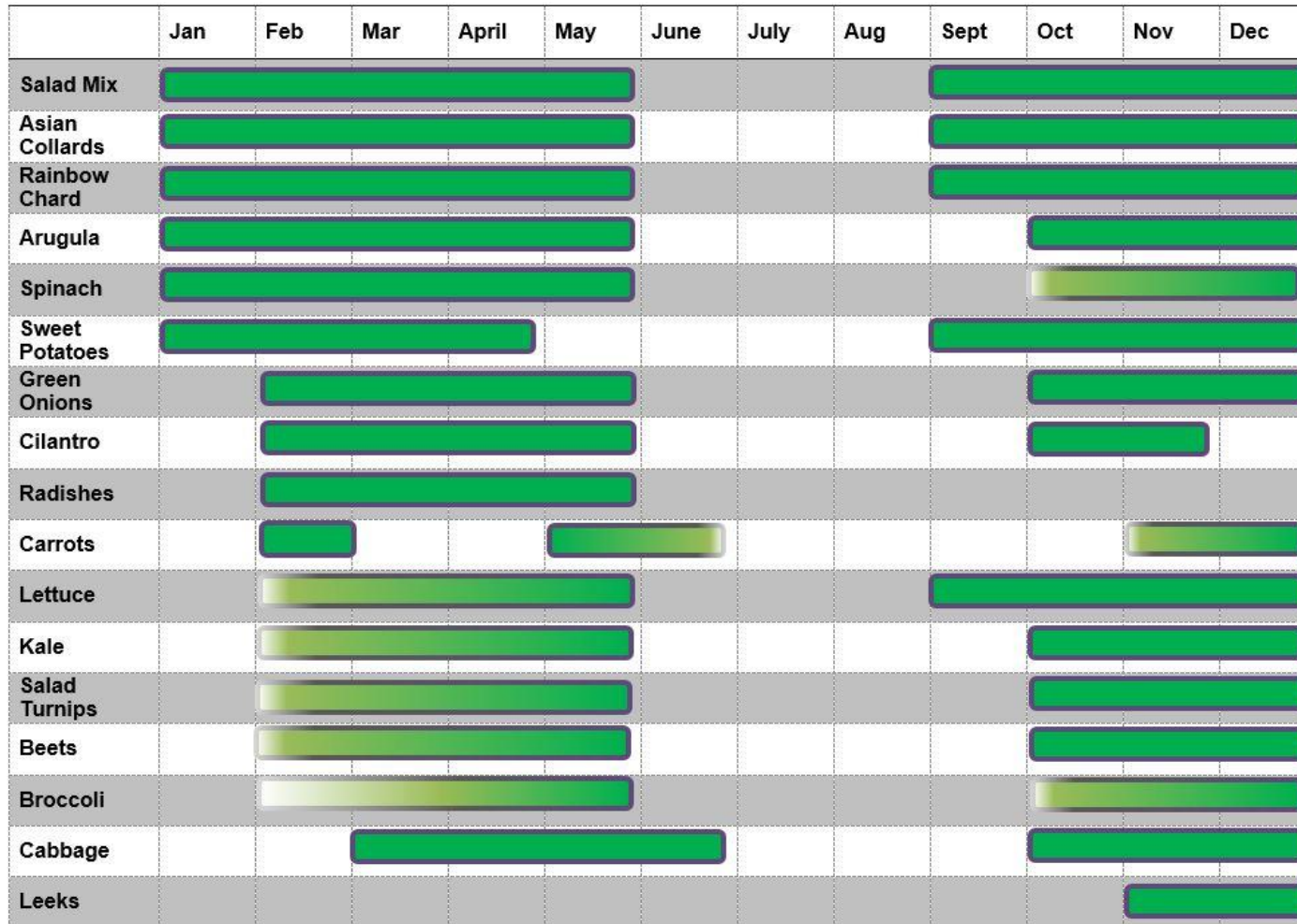
Brought to you by



The Farm
at Penny Lane

Reminder: Eating **raw** or **undercooked** eggs may increase
your risk of foodborne illness.

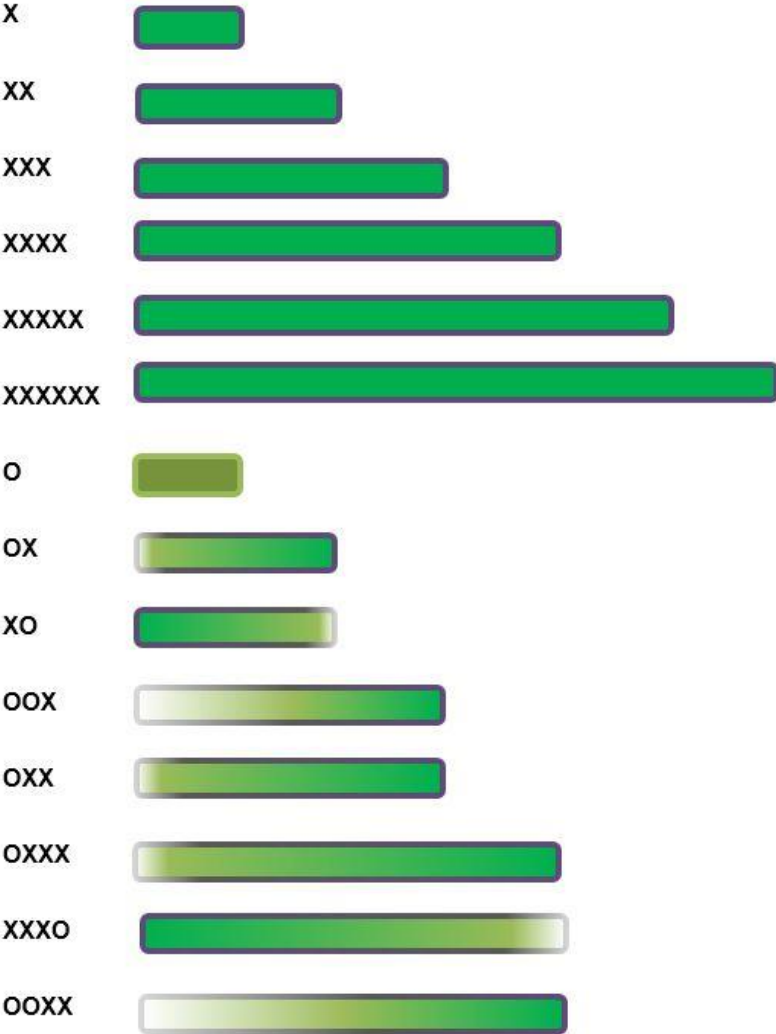
Produce Availability by Season



	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	
Snap Beans					█								
Basil					█								
Cucumbers					█								
Zucchini/ Yellow Squash					█								
Snap Peas					█								
White Potatoes						█							
Eggplant						█							
Bulb Onions						█							
Garlic						█							
Tomatoes						█							
Watermelon						█							
Cantaloupe						█							
Sweet Peppers							█						
Hot Peppers							█						
Winter Squash							█						
Okra							█						

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Strawberries												
Sweet Corn												

Coding Key – Just copy and paste these bars into additional lines on the chart!



How-To Guide

To add more rows to the chart, right click on a row and select “Add Row Below”. (Or “Add Row Above”) Depends on the row you right-clicked on.

To change the size of bars, click on the center of the bar once. Little circles should appear at each of the four corners of the bar. Click and hold down on a circle and drag your mouse around. The bar should change in shape depending on how you move the little circle.

To move a bar, click and hold the center of a bar. Still holding down on the bar, drag your mouse to where you’d like the bar to go.

To change the color of the bar, right-click on the center of the bar. A little menu should appear. Select the bottom option “Format Shape...”. A window should pop up with lots of options about color fill, line color and style, etc.

Produce Seasonality Source: Doug Jones

This document prepared by: Jenny Shen

TODAY WE HAVE...

- salad mix 
- spinach 
- sweet potatoes 
- rainbow chard 
- carrots 
- onions (green onions) 
- cabbage 
- eggs (ask at check-out) 

TODAY WE HAVE...

SALAD MIX — lettuce and mild mustard greens, arugula
flower buds, chickweed

GREEN ONIONS — can be chopped up and included in
almost any food to improve the nutritional value!

SWEET POTATOES

CARROTS

COOKING GREENS - can be chopped up and included in
almost any food to improve the nutritional value!

BABY CHARD (bag) — fine substitute for SPINACH in
many recipes - very tender and fast cooking

BABY COLLARDS (bag) — take longer to cook

BABY KALE (bag) — take longer to cook

Sample Recipe Idea Sheets

What can you do with green, leafy vegetables?

Well, always wash them or rinse them under cold running water...

But then the possibilities are endless!

Here are just a few ideas to get you started

1. Mix with olive oil, vinegar, shredded cheese, fruit pieces and nuts for a refreshing salad. To add in protein, slice up a hardboiled egg to add to the mix!
2. Toss into a pan with some oil, salt, and seasoning/spices for a side dish. Leafy vegetables soften and shrink quickly, so keep an eye on your pan to get the texture that's just right for you. Great place to rest a piece of fish or chicken. For added flavor, top with shredded cheese, salt and pepper, paprika, or minced onion!
3. Cut into smaller pieces and toss into hot pasta, around the time you're adding in the sauce. If you like your vegetables softer, you can cook them in the sauce too. Try adding on some pine nuts or almond slivers for a fuller texture to your meal!
4. Stuff leafy greens into omelets or just stir into scrambled eggs. Tip: cutting up the vegetables into smaller pieces will help them mix in with the eggs.
5. Drop into any stew or soup for added nutrients, flavor, and texture. Works in any stew or soup, including chicken noodle soup, clam chowder, tomato bisque, you name it! If you like vegetables crispy and fresh, add them in after you're done cooking the soup/stew. Otherwise, you can add them in 5-10 minutes before then!

SWEET POTATO RECIPE IDEAS

Reminder: Always wash your fresh veggies and fruits!

1. Sweet potato casserole: Preheat oven to 350°. Boil whole sweet potatoes in large saucepan for 10-15 min. Turn off the stove, drain, and carefully (hot!) mash them until they're soft and gooey. Transfer the mashed sweet potatoes to a baking dish and crack in 1-2 raw eggs and brown sugar. Mix well, top with 1 layer of marshmallows, and bake for 25 min or until marshmallows are light brown.
2. Sweet potato soup: Peel and chop 2 sweet potatoes and 2 large carrots. In a large pot, cook chopped onions, carrots, sweet potatoes, and 1 liter of chicken stock in 1 tablespoon of butter OR some olive oil. Add salt and pepper to taste. Cook on low-medium heat for 20 min. Let it cool for 10 min before transferring to a food processor to blend (puree). Serve hot or chilled. Tip: top with some fresh spices, herbs, or cinnamon!
3. Southwest stuffed sweet potatoes: Bake the whole sweet potatoes at 400° for 30-45 minutes, or until fork tender. Carefully, cut a thin layer off the top of each potato and scoop out most of the flesh. Mash it together with cooked corn, black beans, a dash of low-fat milk (or dollop of low-fat sour cream), and transfer back into the potato skin. Top with salsa, fresh herbs, and drizzle with some olive oil.
4. Roasted sweet potatoes: Chop sweet potatoes into cubes and toss with olive oil, salt, and pepper. Bake at 325° for 30 minutes. Optional: sprinkle with paprika at any point for extra flavor.

SWEET POTATO FACTS

Did you know?

1. You would have to eat 23 cups of broccoli to get the same amount of Vitamin A in ONE sweet potato. Vitamin A is a powerful antioxidant that can help decrease your risk of cancer. Vitamin A also keeps your eyes healthy!
2. Sweet potatoes are also high in Vitamin B5, B6, thiamin, niacin, riboflavin, and carotenoids. All of these components help keep you healthy both physically and mentally!
3. The potassium in sweet potatoes protect your heart and helps you control high blood pressure.
4. Sweet potatoes are fat-free, low-sodium, and have fewer calories than white potatoes.
5. Sweet potatoes also contain nutrients that help your immune system, skin and hair, and digestion.
6. As with all foods, eat in moderation. Too much sweet potato can add up in carbs and calories. You may also notice an orange tinge to your skin or nails after eating too many sweet potatoes, but the color is harmless to your health.
7. Avoid eating too much sweet potato if you have a history of kidney stones.

CARROT RECIPE IDEAS

Reminder: Always wash your fresh veggies and fruits!

1. Add steamed or boiled carrots to pasta, rice, stews, and soups! They bring a vibrant color, taste, and texture to your meal.
2. Carrot fries: Carefully chop carrots into fry-shaped pieces – easier with bigger carrots. Toss pieces with olive oil, salt and pepper. Arrange pieces in a single layer on parchment paper on baking sheet and bake for 10 min at 425°. Flip fries and continue to bake until slightly crispy.
3. Roasted carrots: Peel fresh carrots and slice into wedges about 1-2 inches thick. Toss with olive oil, salt, pepper, and other seasoning you enjoy in a large bowl. Arrange into even layer on baking sheet and bake 20-25 min or until tender.
4. Carrot juice: If you have a blender, you can make all sorts of juices with carrots and other ingredients. Try blending washed fresh carrots with cucumbers, grapefruits, oranges, apples, and pears. If you're feeling adventurous, maybe some fresh-squeezed lemon or lime? Sliced ginger? Or even raw beetroot? Throw in some ice cubes for a refreshing summer drink!

CARROT FACTS

Did you know?

1. Carrots have high levels of beta-carotene, which helps you keep your eyes, skin, teeth, and bones healthy. (Our body turns beta-carotene into the more familiar Vitamin A!)
2. All the fiber found in carrots help protect your digestive system from cancer and also keeps your bowels regular.
3. Carrots also contain Vitamin C, potassium, Vitamin B6, and folate. Together, all these nutrients keep your body healthy both physically and mentally. They also help prevent cancer and diseases of the nervous system. Minerals help protect your heart, blood vessels, and bones.
4. Minerals high in carrots include calcium and magnesium, which help protect your heart, support your immune system, and keep your bones strong as you age.
5. There is more sugar in carrots compared to other vegetables, which makes carrots a tasty and refreshing snack, either raw or juiced.
6. Eating too many carrots might give you a slight orange tinge to your skin and nails. This color is harmless to your health.